JOURNAL OF THE EXPERIMENTAL ANALYSIS OF BEHAVIOR 1978, 29, 347-349 NUMBER 2 (MARCH)

IS OPERANT CONDITIONING GETTING BORED WITH BEHAVIOR?[1]

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My mood, as I approached a review of the *Handbook of Operant Behavior*,[2] combined apprehension, like Rip Van Winkle, after 6 yr of a heavy schedule of teaching and administration that had taken me away from laboratory work and experimental journals; and interest and enthusiasm over the opportunity to see what my chosen professional field had been up to. I read the chapters, one every week or so, as part of a group of three faculty and three graduate students[3] who met to discuss the chapters in turn, or to talk about whatever thoughts they evoked. It was an unusually informed group of commentators, many of whom, particularly the graduate students, had read the bulk of the references cited in most of the chapters. Our combined interests covered most of the empirical themes represented in the *Handbook*.

With relatively minor exceptions, it was clear that the *Handbook* was a comprehensive, technically detailed and representative view of what constituted the field of operant conditioning at the present time. It would not be useful to review the scope and content of the *Handbook* in detail. An erudite committee with collective wisdom is necessary to read all of the individual chapters, technically and in an informed manner. If our experience is a guide, it will be many months before most readers cover a substantial portion of the book, and except for study groups like ours at The American University and student study seminars, few are likely to read the *Handbook* in its entirety.

Although the *Handbook* is not presented by its editors as a continuation of the earlier book edited by Honig (W. K. Honig, *Operant Conditioning: Areas of Research and Application*. New York: Appleton-Century-Crofts, 1966), the function of the two books for the experimental analysis of behavior is so similar that a comparison is compelling. The new book continues basic themes such as chaining, conditioned reinforcement, contingencies of control in schedules of reinforcement, aversive control, verbal behavior, and the usual chapters on the practical use of the free operant for the study of physiological and sensory phenomena. It was in the new themes that appeared, unheard of when I was a student and not yet on the horizon the first book appeared, that the special character of the present book is apparent. These themes included major sections on autoshaping, stimulus contrast, peak shift, Premack's principle, schedule contrast, the matching law, induced aggression, schedule induced behavior, and Pavlovian conditioning.

The *Handbook* revives the conflict, that was the dilemma of the "fifties", between descriptive empirical discovery and verbally interesting theoretical comment. Operant conditioning, as it appears in the *Handbook*, seems no longer vulnerable to the long-standing complaint that although substantial control was achieved in the laboratory, the results could neither be written about clearly nor presented as other than a distressingly detailed atlas of behaviors. Even the most technical and arcane sections of the *Handbook* are clearly written. I speculated that the extensive theoretical arguments, reminiscent of Hull's and Spence's style of hypothesis testing and deduction, rather than the traditions of JEAB, was in many cases the impetus for the persuasive and communicable style. Traditionally, the major reinforcer that led so many into operant

[1]Reprints may be obtained from the author, Department of Psychology, The American University, Washington, D.C. 20016.

[2]W. K. Honig and J. E. R. Staddon. *Handbook of operant behavior*. Englewood Cliffs: Prentice-Hall, Inc., 1977.

[3]Walter Stanley, Anthony Riley, Charles Schindler, David Peele, and Shin-Yuan Tsai.

conditioning was the opportunity to condition a rat or a pigeon that resulted in a powerful personal experience of controlling the behavior of an individual animal. In one moment, psychology became converted, for these students, from something read about passively to a practical and powerful activity that influenced large magnitudes of behavior instantly and in orderly ways. For these students, the result of the experiment was more important than what could be said about it. Although a certain level of inarticulateness has been, at times, a badge of honor for those for whom the study of psychology was inseparable from the functional control of the behavior of the individual animal, the real concern was deeper, in the basic motives for working.

An unfortunate byproduct of the easy communicative writing style of some of the sections of the *Handbook* is the use of colloquial and mentalistic expression at the expense of accurate description. "Extinction" is used in several chapters as both a procedure and a change in behavior, as are terms such as "incentive", "hunger", and "anticipation".

During the period following the publication of *The Behavior of Organisms* and *Schedules of Reinforcement,* there was much criticism of the research reported there for being a loose collection of factual information and without a theoretical superstructure. It was, in fact, a highly theoretical enterprise in which a complicated mass of observations and empirical phenomena took an orderly, and soon to be familiar shape and structure, through the way the independent variables were organized by chapter and section, rather than by an elaborate verbal account. Perhaps one of the salient features of the work reported in *The Behavior of Organisms* and *Schedules of Reinforcement* was the use of the cumulative record to depict the course of events continuously in time and therefore simulated, for the reader, the direct experience that the experimenter had when the experiment was done. On the other side, the experimental literature, in the tradition of Hull and Spence, psychological testing, statistics, and theoretical models, were the antithesis to the direct, immediate, and forceful control of the behavior of the individual organism. These two currents come together in the *Handbook,* much as a recapitulation of the tension of the early "fifties", with a very marked return to the theoretical style of pre-Skinner psychology.

The relation between the discoveries of experimentation and the verbal behavior about it is a subtle one. Obviously, any scientific finding must have a verbal form if it is to influence anyone other than the person carrying out the experiment. Science is ultimately a social enterpise, despite the concern that nature be described objectively and dispassionately, with safeguards against personal influence. While there are still sections of the *Handbook* where the discovery and description of empirical phenomena is primary, these are more than offset by the extensive portions of chapters organized around various theoretical or conceptual issues.

One can speculate about the reinforcer maintaining the behavior of the writers of the various chapters of the *Handbook*—whether the reinforcer is the direct experience of altering the behavior of the experimental subject or the argument and discussion that becomes possible as a result of the empirical discovery. Correspondingly, one can speculate whether the reader's reinforcer is the description of the altered behavior, with the conviction that the prescription provided by the investigator would permit, were the laboratory facilities available, accomplishment of the same result; or, whether the reinforcer is the argument and discussion that the observations make possible. For some, there is a magical sense of playful achievement when a procedure is converted to orderly behavioral control. For others, there must be a comparable magical play in converting the experiment's behavioral control to a verbal scheme. For one experimenter, the validation of the experiment is the change in the behavior of the individual subject, guided by a principle or instruction. For the other, the observations are merely a first step to secure the personal and social validation that occurs when the theory or conceptual scheme is argued. In other words, is the play of the experiment in what one says, or is it in what had been done? Is the reinforcer the experience of altering behavior, using the prescription provided by the investigator, or is it the argument and discussion that the results generate? The chapters of the *Handbook* span the full range of this continuum, but this reviewer found a preponderance of the latter, and I must confess a nostalgia for the former.

I would have hoped that 10 yr after the publication of *Operant Conditioning: Areas of Research and Application* the field of operant conditioning would not still be preoccupied with its practical and theoretical usefulness to other disciplines, such as physiology, psychopharmacology, linguistics, and ethology. Twenty years ago, there was a pressure to validate the experimental analysis of behavior by showing the way it could contribute practically to other scientific disciplines and to the solution of practical problems in everyday human affairs. Many of these applications have fared extraordinarily well, and in many cases are established traditions in the respective disciplines. But, insofar as these are applications of behavioral discoveries, their major contribution and thematic emphasis is in the discipline where they are applied, rather than in behavioral analysis itself. In retrospect, there was large tension during the pioneer years of the experimental analysis of behavior to show that operant conditioning mattered. Operant conditioning demanded a place as a discipline, propaedeutic to the other disciplines of biology, not only because the behavior of organisms was the ultimate expression of its total physiological and phylogenetic processes but also to prove its worth. Perhaps the time has come for operant conditioning to use the discoveries of other disciplines to advance the knowledge about the experimental analysis of behavior—reverse lend lease. Practitioners share many of the experiences of empirical research because their treatments are reinforced and shaped by the behavior they encounter in practice. Most importantly, they expose phenomena and types of behavioral control which otherwise would not be visible. These discoveries, although not usually established with scientific caution, are a source of hypothesis about independent variables and types of behavioral control that have not yet been studied in the laboratory.

The urge toward practical application and validation in other fields is a paradoxical incongruity with the main accomplishments of operant conditioning. Much of the early research in the various areas of schedules of reinforcement was playful, in the sense that the behavior of the experimenter was maintained and shaped by the interaction with the phenomena that were emerging in the experiment. The discoveries were of no known practical value, and many of the phenomena that emerged were creations of the laboratory that had never existed in nature heretofore. Two senses of control came from the basic laboratory research, and are parallel to their playful and practical aspects. The one sense of control is practical because the results of the experiments were used by other disciplines in the manner that the intermittently reinforced free operant served as technique for studying the effects of drugs. The other sense of control is the confidence in one's competence, like the control that a youngster exercises over the movement of a baseball, which surely extends into related spheres of activity. In conditioning a pigeon, for example, the predictable and fine-grain interplay between the activity of the experimenter and the change in behavior of the pigeon is playful in much the same sense that one plays with a pinball machine or a child plays with the bounce of a ball off of the wall by throwing the ball in different ways and experiencing the different trajectories. Experiences such as conditioning a pigeon are practical also because the control achieved over the behavior is different only in kind from pressing social problems or from applications that are needed for other scientific disciplines. If it is possible to control the behavior of the individual organism in the laboratory so substantially and predictably, then surely the same genera of activity could solve a specific problem. Like the transition from the child's play to the adult's work, the successful manipulation of the environment during play is a metaphor of the competences that have practical usefulness in work. One is tempted to wonder whether the large changes that appear to be reflected in the *Handbook* is what happens to children who are not allowed to play. If one cannot play with the direct aspects of behavioral control, then perhaps the only alternative is to play with the words.

Overall, the *Handbook* is a survey of the various fields of research in which operant methodology has a prominent place. The cumulative work of the various authors who contributed to it is an impressive scholarly accomplishment that will remain as a useful source book for some years to come.

Received 30 July 1977.
(Final acceptance 30 July 1977.)